

REMARKS

Independent claim 1 has been amended. Support for the amendments to independent claim 1 can be found in the Specification as originally filed ("the Specification") at, for example, p. 3, paragraph [0010]; p. 8, paragraph [0039]; p. 10, paragraph [0048]; and FIG. 10. Claims 4, 10, 13, 14, and 47 have also been amended for consistency with base claims and/or to clarify the limitations therein.

Claims 2, 5, 41 and 46 have been canceled. The limitations of claim 41 have been substantially incorporated into claim 36, which has been amended. Claims 4 and 47 have been amended to correct the dependency of the claims therein.

New claims 49-52 have been added. Support for claim 49 can be found in the Specification, for example, at p. 11, paragraph [0052]. Support for claim 50 can be found in the Specification, for example, at p. 7, paragraph [0035]. Support for claims 51-52 can be found in the Specification, for example, at p. 4, paragraph [0024]; pp. 7-8, paragraph [0037]; and p. 10, paragraph [0038]. Claims 1, 3-8, 10-21, 33-36, 42-44, and 47-52 are now pending in the present application.

Applicants respectfully request allowance of the present claims in view of the foregoing amendments and the following remarks.

A. 35 U.S.C. 112, second paragraph Rejections

Claims 1-8, 10-21, 33-36, 41-44, and 46-48 were previously rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner has taken the position that the term "fluid" is known to be a substance (as liquid or gas) tending to flow or conform to the outline of its container." See pp. 2-3 of the June 3, 2009 Office Action. According to the Examiner, "given the indefinite number of substances that will meet such definition and the different properties that each substance should have (i.e. such as velocity), it is difficult to determine what type of permeability will be that necessary." See pp. 2-3 of the June 3, 2009 Office Action. Applicants have deleted the relevant subject matter in claim 1, thereby rendering the rejection moot. Applicants note the addition of new dependent claim 49, which requires that the fabric has a permeability sufficient to enable storage of liquids within the discrete voids.

B. 35 U.S.C. 103 Rejections

Claims 1-8, 10-14, 16-21, 33-34, 41, and 45-48 were last rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,475,904 to LeRoy (LeRoy) in view of U.S. Patent No. 5,396,689 to Vuillaume (Vuillaume) and U.S. Patent No. 6,863,960 to Curro et al. (Curro et al.). Claims 15, 35-36 and 42-44 were rejected under 35 U.S.C. 103(a) as being unpatentable over LeRoy, Vuillaume, and Curro et al., and further in view of Suzuki et al. (Suzuki et al.). Claim 45 was rejected under 35 U.S.C. 103(a) as being unpatentable over LeRoy, Vuillaume, and Curro et al., and further in view of WO88/01570 to Towery et al. (Towery et al.).

i) Independent claim 1

For the convenience of the Examiner, independent claim 1 (as amended) is set forth below:

A nonwoven fabric comprising:

at least two separate but interconnected fibrous layers having discrete voids between the fibrous layers, wherein the fibrous layers comprise a base layer and an upper layer;

wherein said base layer and upper layer comprise a continuous array of hydroentangled and consolidated fibers; and

wherein the base layer is disposed below the voids, the upper layer is disposed over the voids, and the base layer and the upper layer are interconnected between the voids such that the voids are bounded in all directions by hydroentangled and consolidated fibers.

As set forth at p. 3, paragraph [0010] of the Specification of the present application, during manufacture of the claimed product, “water jets are impinged on the webs to simultaneously entangle and consolidate fibers in both layers as well as interconnect adjacent layers.” (emphasis added) In this way, the water jets also “bond and interconnect the separate fibrous layers on and between the spacer system elements. The spacer system elements are [then] withdrawn to produce an integrated 3D fabric structure.” See p. 8, paragraph [0039] of the Specification. The resulting product thus comprises a base layer comprising hydroentangled and consolidated fibers disposed below the voids and an upper layer comprising hydroentangled and consolidated fibers disposed over the voids with the base layer and the upper layer also being interconnected between the voids. In this way also, the voids of the claimed nonwoven fabric are bounded in all directions by hydroentangled and consolidated fibers.

Applicants respectfully submit that the combination of LeRoy, Vuillaume, and Curro et al. does not teach or suggest at least the above-italicized limitations, including that the voids are bounded in all directions by hydroentangled and consolidated fibers. In fact, the primary reference, LeRoy, actually teaches away from the claimed invention. “A prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness.” See MPEP 2143.01. In particular, LeRoy is directed to a process wherein two laps are needled together between longitudinal guide tubes which maintain spacing between the laps. See Abstract of LeRoy. At col. 3, lines 55-60, LeRoy explains that the “needles are arranged in such a way that they penetrate basic laps (A) in the longitudinal spaces between the longitudinal ribs (22) of table (2) producing longitudinal join lines (14) between the two basic laps (A).” The ribs 22 are “designed with at least one longitudinal duct 26 through which a fluid and/or solid interleaved constituent may pass.” See col. 3, lines 56-59 of LeRoy. Accordingly, even if the teachings of LeRoy were modified with the teachings of Vuillaume to substitute hydroentanglement for the needling technique of LeRoy, one would still not arrive at the claimed invention because the combination of LeRoy and Vuillaume would at most suggest to one skilled in the art that the two fabric layers should be manipulated/hydroentangled only at a point between the ribs 22 of LeRoy. Thus, the resulting product of the combination of LeRoy and Vuillaume would not have a base layer comprising hydroentangled and consolidated fibers disposed below voids and an upper layer comprising hydroentangled and consolidated fibers disposed over voids, nor voids being bounded in all directions by hydroentangled and consolidated fibers.

Further, even if the teachings of LeRoy were modified with the teachings of Vuillaume to substitute hydroentanglement for the needling technique of LeRoy, one would still not arrive at the claimed invention because the ribs 22 of LeRoy would prevent any water jets from contacting the laps of LeRoy at points above and below the ribs 22. Thus, the produced product would not have areas of hydroentangled and consolidated fibers over and/or below its voids nor could the whole dimensions of each void be controlled. Applicants stress that the ribs 22 of LeRoy may not be removed because the ribs 22 function to introduce a fluid and/or a solid interleaved constituent. See col. 3, lines 56-59 of LeRoy. Thus, for these reasons further, the

combination of LeRoy and Vuillaume would not teach or suggest a base layer comprising hydroentangled and consolidated fibers disposed below voids and an upper layer comprising hydroentangled and consolidated fibers disposed over voids, nor voids bounded in all directions by hydroentangled and consolidated fibers.

In addition, Applicants submit that Curro et al. fails to correct the deficiencies of LeRoy and Vuillaume. As is clearly shown in FIG. 6 and explained at col. 10, lines 16-29, Curro et al. discloses a process, wherein a first fabric layer 20 and a second fabric layer 40 are joined at bond sites 50 between pockets of a substance 30 by melting the first layer 20 into the second layer 40 at the interface between the two materials. As shown in FIG. 9 of Curro et al., the join sites 50 are produced by the large heated roller 110. Accordingly, Curro et al. does not manipulate any of the fabric fibers above or below the cavity comprising the substance 30. As a result, Curro et al. also does not teach or suggest a base layer comprising hydroentangled and consolidated fibers disposed below voids, an upper layer comprising hydroentangled and consolidated fibers disposed over voids, nor voids bounded in all directions by hydroentangled and consolidated fibers. See pp. 7-8 of the August 3, 2009 Office Action.

Moreover, Suzuki et al. and Towery et al. fail to correct the deficiencies of LeRoy, Vuillaume, and Curro et al. Suzuki is directed to nonwoven fabrics having multilayer structures. Applicants note that the Examiner had cited Suzuki for its alleged disclosure of a nonwoven structure having a hydrophobic and a hydrophilic layer. Towery et al., on the other hand, is directed to water vapor-permeable, yet waterproof-coated fabric. Towery et al. was cited by the Examiner for its alleged disclosure of applying a polyurethane resin to the fabric.

In view of the above, Applicants respectfully submit that independent claim 1 as amended is in condition for allowance.

ii) Dependent claims 3-4, 6-8, 10-21, 33-36, 42-45, and 47-52

Claims 3-4, 6-8, 10-21, 33-36, 42-45, and 47-52 each also require the limitations of claim 1. Accordingly, Applicants respectfully submit for at least the reasons set forth above with respect to independent claim 1, claims 3-4, 6-8, 10-21, 33-36, 42-45, and 47-52 are also in condition for allowance.

In addition, Applicants respectfully submit that dependent claim 4 provides further reasons for allowance. Dependent claim 4 requires that the voids comprise a

plurality of channels having a cylindrical or tubular shape. As discussed above, LeRoy discloses contacting its fibers with its needles at points between ribs 22 to bind its two fabric layers together. Additionally, the needles of LeRoy are unable to contact the fibers above and below its voids, and can only contact the fabric between its ribs 22. Further, Applicants again stress that the ribs 22 may not be removed because the ribs 22 of LeRoy function to introduce a fluid and/or a solid interleaved material. See col. 3, lines 56-59 of LeRoy.

As a result of the above characteristics of LeRoy, full internal void shaping is simply not made possible by LeRoy (even if modified by Vuillaume and Curro et al.). Forming a nowoven fabric having voids of a predetermined three dimensional shape, e.g., cylindrical or tubular channels, necessarily requires manipulation of all fibers about a spacer element. However, as indicated above, the ribs 22 of LeRoy would clearly prevent this from occurring and the ribs may not be removed. Thus, the product formed by LeRoy (even if modified by Vuillaume and Curro et al.) could not have voids that are completely defined by respective spacer elements in the form of channels having a cylindrical or tubular shape. In fact, the resulting voids in the product of LeRoy must be relatively flat since they cannot be wholly shaped about a spacer element. In view of the above, Applicants respectfully submit that neither LeRoy, Vuillaume, nor Curro et al., individually or collectively, teaches or suggests voids comprising a plurality of channels with a cylindrical or tubular shape. Thus, dependent claim 4 provides further reasons for allowance.

iii) New claims 49-52

Applicants also respectfully submit new claims 49-52 provide further reasons for allowance. New dependent claim 49 requires that the fabric has a permeability sufficient to enable storage of liquids within the discrete voids. None of the cited references, alone or in combination, teach or suggest the storage of liquids in voids that are bounded in all directions by hydroentangled and consolidated fibers. Accordingly, new claim 49 provides further reasons for allowance.

New dependent claim 50 is dependent on claim 49 and requires that the fabric comprises natural fibers. Applicants note that the fibers of Curro et al. must be thermoplastic (synthetic, and not natural fibers) as the fibers of each layer in Curro et al. must melt for the layers to join as described above. Thus, the combination of cited references, including Curro et al., does not teach or suggest the storage of

liquids in voids that are bounded in all directions by hydroentangled and consolidated natural fibers. Accordingly, new claim 50 provides further reasons for allowance.

New dependent claim 51 requires that the discrete voids have a controlled three-dimensional shape between the two fibrous layers of fabric. None of the cited references, alone or in combination, teach or suggest discrete voids having a controlled three-dimensional shape between the two fibrous layers of fabric. As set forth above, the claimed product is made by consolidating and hydroentangling fibers completely about a spacer element, thereby forming the claimed article of independent claim 1 that has voids bounded in all directions by hydroentangled and consolidated fibers. Since the cited references do not disclose any process that consolidates and hydroentangles fibers completely about a spacer element (ribs 22 of LeRoy prevent this), the cited references also cannot teach or suggest a product having “discrete voids hav[ing] a controlled three-dimensional shape between the two fibrous layers of fabric.” Accordingly, new claim 51 provides further reasons for allowance.

New dependent claim 52 requires that each of the plurality of discrete voids corresponds to a respective three-dimensional shape of a spacer element removed from between the two fibrous layers during manufacture of the nonwoven fabric. Since none of the cited references teach or suggest any process that consolidates and hydroentangles fibers about a spacer element, the cited references, alone or in combination, cannot also teach or suggest a product wherein “each of the plurality of discrete voids corresponds to a respective three-dimensional shape of a spacer element removed from between the two fibrous layers during manufacture of the nonwoven fabric.” Accordingly, new claim 52 provides further reasons for allowance.

C. Conclusion

Applicants submit that all claims are in condition for allowance and request that a Notice of Allowance be issued. Should any further informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

November 3, 2009

Date



Mark W. Scott (Reg. No. 52,202)
Beusse Wolter Sanks Mora & Maire, P.A.
390 North Orange Ave., Suite 2500
Orlando, FL 32801
Telephone: 407-926-7724
Fax: 407-926-7720